What is claimed is:

1. A method for growing a plurality of carbon nanotubes, the method comprising:

forming hydroxyl groups (112) on a silicon-oxide substrate (100);

immersing the substrate (100) in an aqueous solution including an iron-containing salt and hydroxylamine and forming iron-containing nanoparticles (110) on the substrate (100);

calcining the substrate (100) and forming iron oxide nanoparticles (120) thereon; and

using the iron oxide nanoparticles (120) as a catalyst, growing carbon nanotubes (130).

2. The method of claim 1, wherein growing carbon nanotubes includes introducing a carbon-containing gas to the iron oxide nanoparticles and, using the iron oxide as a catalyst, reacting the carbon-containing gas and growing the carbon nanotubes from the iron oxide nanoparticles with carbon from the reaction.

3. The method of claim 1, wherein forming iron oxide nanoparticles includes forming a sub-monolayer of uniformly distributed iron-oxide nanoparticles.

4. The method of claim 1, wherein calcining the substrate and forming iron oxide nanoparticles includes converting the iron-containing nanoparticles to Fe_2O_3.

5. The method of claim 1, wherein immersing the substrate in an aqueous solution including an iron-containing salt and hydroxylamine and forming iron-containing nanoparticles on the substrate includes reducing the iron-containing salt to form the iron-containing nanoparticles.

6. The method of claim 5, wherein reducing the iron-containing salt includes using the hydroxylamine to reduce the iron-containing salt.

7. The method of claim 1, wherein immersing the substrate in an aqueous solution including an iron-containing salt and hydroxylamine and forming iron-containing nanoparticles on the substrate includes using hydroxyl groups on the silicon-oxide substrate to mediate the formation of the iron-containing nanoparticles.

8. The method of claim 1, wherein immersing the substrate in an aqueous solution including an iron-containing salt and hydroxylamine and forming iron-containing nanoparticles on the substrate includes selecting the pH of the aqueous solution to control at least one of: the size and density of the iron-containing nanoparticles.

9. The method of claim 8, wherein immersing the substrate in an aqueous solution including an iron-containing salt and hydroxylamine and forming iron-containing nanoparticles on the substrate includes selecting the reaction time that the substrate is immersed to control at least one of: the size and density of the iron-containing nanoparticles.

10. The method of claim 1, wherein immersing the substrate in an aqueous solution including an iron-containing salt and hydroxylamine and forming iron-containing nanoparticles on the substrate includes selecting the reaction time that the substrate is immersed to control at least one of: the size and density of the iron-containing nanoparticles.

11. The method of claim 1, wherein immersing the substrate in an aqueous solution including an iron-containing salt includes immersing the substrate in an aqueous solution including iron-chloride material.

12. The method of claim 1, wherein forming hydroxyl groups on the silicon-oxide substrate includes hydroxylating the silicon-oxide substrate with the hydroxylamine.

13. The method of claim 1, wherein growing carbon nanotubes includes growing a single-walled carbon nanotube.

14. The method of claim 1, wherein calcining the substrate and forming iron oxide nanoparticles thereon includes forming a catalyst island.

15. The method of claim 1, wherein growing carbon nanotubes includes forming a nanotube field effect transistor.

16. The method of claim 1, wherein growing carbon nanotubes includes growing at least one carbon nanotube extending between two electrodes.

17. The method of claim 1, further comprising:

patterning wells in a patternable material on the substrate; and

wherein forming iron-containing nanoparticles on the substrate includes forming iron-containing nanoparticles in the wells, wherein calcining the substrate and forming iron oxide nanoparticles includes forming iron oxide nanoparticles from the iron-containing nanoparticles formed in the wells and wherein growing carbon nanotubes includes growing carbon nanotubes extending from the iron oxide.

18. The method of claim 17, wherein growing carbon nanotubes extending from the iron oxide in the wells includes growing a carbon nanotube extending between two electrodes.

19. The method of claim 18, further comprising forming a back gate in the substrate and between the two electrodes, the back gate being configured and arranged to capacitively couple a voltage to the carbon nanotube extending between two electrodes.

20. The method of claim 17, further comprising removing the patternable material after forming the iron-containing nanoparticles and prior to calcining the substrate and forming iron oxide nanoparticles.

21. The method of claim 17, further comprising removing the patternable material after forming the iron-containing nanoparticles and prior to growing carbon nanotubes extending from the iron oxide.

22. A method for preparing a substrate (100) for growing carbon nanotubes, the method comprising:

forming hydroxyl material (112) on the substrate (100); and

immersing the substrate (100) in an aqueous solution including an iron-containing material and a reducing agent and forming iron-containing nanoparticles (110) on the substrate (100).

23. The method of claim 22, further comprising:

after forming the iron-containing nanoparticles, heating the substrate and forming iron oxide nanoparticles from the iron-containing nanoparticles.

24. The method of claim 23, further comprising:

using the iron oxide nanoparticles (120) as a catalyst, introducing a carbon-containing gas to the iron oxide nanoparticles to grow carbon nanotubes (130).

25. A method for growing a carbon nanotube, the method comprising:

immersing a substrate (100) in an aqueous solution including an catalyst precursor material and a reducing agent to form catalyst precursor material (110) on the substrate (100);

reacting the catalyst precursor material (110) to form a catalyst (120) on the substrate (100); and

using the catalyst (120) to catalyze the growth of the carbon nanotube (130).

26. A system for growing a plurality of carbon nanotubes, the system comprising:

means for forming hydroxyl groups (112) on a silicon-oxide substrate (100);

means for immersing the substrate (100) in an aqueous solution including an iron-containing salt and hydroxylamine and forming iron-containing nanoparticles (110) on the substrate (100);

means for calcining the substrate (100) and forming iron oxide nanoparticles (120) thereon; and

means for using the iron oxide nanoparticles (120) as a catalyst for growing carbon nanotubes (130).

27. The system of claim 26, wherein the means for calcining the substrate and forming uniformly-distributed iron oxide nanoparticles thereon includes a furnace.

28. The system of claim 26, wherein the means for using the iron oxide nanoparticles as a catalyst and growing carbon nanotubes includes a furnace chamber.

29. A system for growing a plurality of carbon nanotubes, the system comprising:

an immersion chamber adapted for forming hydroxyl groups (112) on a silicon-oxide substrate (100);

an immersion tank adapted for immersing the substrate (100) in an aqueous solution including an iron-containing salt and hydroxylamine and for forming iron-containing nanoparticles (110) on the substrate (100);

a furnace arrangement adapted for calcining the substrate (100) and forming iron oxide nanoparticles (120) thereon; and

a chemical deposition chamber adapted for using the iron oxide nanoparticles (120) as a catalyst and growing carbon nanotubes (130).

30. The system of claim 29, wherein the immersion chamber and the immersion tank are a single arrangement adapted to hold a solution for forming both the hydroxyl groups and the iron-containing salt on the silicon-oxide substrate.

31. The system of claim 29, wherein the furnace arrangement and the chemical deposition chamber are a single arrangement including a chemical vapor deposition (CVD) chamber adapted to both calcine the substrate and deposit carbon, using the catalyst to react a carbon-containing gas, for growing the carbon nanotubes.

32. A carbon nanotube growth arrangement comprising:

a substrate (100);

hydroxyl molecules (112) on the substrate (100); and

iron-containing nanoparticles (110) coupled to the hydroxyl molecules (112).

33. A carbon nanotube device comprising:

a single-walled carbon nanotube extending from catalyst material on a substrate; and

the substrate and the catalyst material having characteristics of the catalyst material being formed by immersion in an aqueous solution including an iron-containing salt and hydroxylamine, with iron-containing nanoparticles being formed on the substrate and subsequently calcined to form iron oxide nanoparticles thereon.